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NEWS BRIEFS

Armed Robots Soon Marching To Battle?

By Sgt. Lorie Jewell
Army News Service

By Sgt. Lorie Jewell
With a weapons platform mounted to a Talon robot, the SWORDS system allows Soldiers to fire small arms weapons by remote control from as far as 1,000 meters away. The system, demonstrated this week at the biennial Army Science Conference, may soon join Soldiers in Iraq.

ORLANDO, Fla. - Soldiers may have armed robots as battle buddies by early next year, according to industry and military officials attending the biennial Army Science Conference.

The Special Weapons Observation Reconnaissance Detection System, or SWORDS, will be joining Stryker Brigade Soldiers in Iraq when it finishes final testing, said Staff Sgt. Santiago Tordillos, a bomb disposal test and evaluation NCOIC with the EOD Technology Directorate of the Army's Armament Research, Development and Engineering Center at Picatinny Arsenal, N.J.

"We're hoping to have them there by early 2005," Tordillos said. "The Soldiers I've talked to want them yesterday."

The system consists of a weapons platform mounted on a Talon robot, a product of the engineering and technology development firm Foster-Miller. The Talon began helping with military operations in Bosnia in 2000, deployed to Afghanistan in early 2002 and has been in Iraq since the war started, assisting with improvised explosive device detection and removal. Talon robots have been used in about 20,000 missions in Iraq and Afghanistan, according to Foster-Miller reports.

"It's not a new invention, its just bringing together existing systems," said Tordillos, who has been involved with the project since its inception about a year and a half ago.

Different weapons can be interchanged on the system - the M16, the 240, 249 or 50-caliber machine guns, or the M202 -A1 with a 6mm rocket launcher. Soldiers operate the SWORDS by remote control, from up to 1,000 meters away. In testing, it's hit bulls eyes from as far as 2,000 meters away, Tordillos said. The only margin of error has been in sighting, he added.

"It can engage while on the move, but it's not as accurate," Tordillos said.

The system runs off AC power, lithium batteries or Singars rechargeable batteries. The control box weighs about 30 pounds, with two joysticks that control the robot platform and the weapon and a daylight viewable screen.

SWORDS recently was named one of the most amazing inventions of 2004 by Time Magazine.

There are four SWORDS in existence; 18 have been requested for service in Iraq, Tordillos said. So far, each system has cost about $230,000 to produce, said Bob Quinn, lead integrator for the project. When they go into production, Quinn estimates the cost per unit will drop to the range of $150,000 to $180,000.

Quinn credits Soldiers with getting the project started.

"It's a classic boot-strap effort," said Quinn.

Tordillos fielded a variety of questions while showing off the system in the exhibit hall. Soldiers wanted to know what military

occupational speciality they have to sign up for in order to work with the system. There is no specific MOS for it, he said.

Other questions were more thought provoking. Does he envision a day when armed robots outnumber humans on the battlefield? Tordillos firmly said no.

“You’ll never eliminate the Soldier on the ground,” he said. “There’ll be a mix, but there will always be Soldiers out there.”

By Sgt. Lorie Jewel
Staff Sgt. Santiago Tordillos operates the armed robotic system by remote control with two joy sticks on a control panel, tracking where it's going on a small screen.

Fielding Begins For The Next-generation Military GPS Receiver

Project Manager--Global Positioning System

FORT MONMOUTH, N.J.--GPS technology first gained widespread use in Operation Desert Storm. During the 1990s, Product Manager GPS fielded a military handheld GPS receiver called the Precision Lightweight GPS Receiver (PLGR). A key feature of PLGR was the communication security feature that provided military users with a performance advantage over commercial receivers. Eventually, over 112,000 PLGR were fielded to U.S. forces worldwide.

Today, PLGR still provides jam-resistant GPS data to Army users worldwide including those deployed to Operation Enduring Freedom and Operation Iraqi Freedom.

Continued product evolution has brought us the Defense Advanced GPS Receiver (DAGR) which will supplement PLGR to give units their full complement of GPS receivers, and will eventually replace PLGR . With first-article testing completed and production approval granted, PM GPS placed the first order for 10,000 DAGRs and began fielding in November 2004. Over the next few years, displaced PLGRs will be recycled to fill GPS requirements in lower priority units. The total Army requirement for handheld GPS receivers is estimated to exceed 140,000 units.

DAGR; the new one pound advanced next-generation military handheld GPS receiver stands next to its predecessor, the four-pound PLGR.

In addition to being a smaller more capable replacement for PLGR, DAGR also introduces the next-generation of communications security technology called Selective Availability Anti-Spoof Module (SAASM). DAGR provides improved anti-jam performance in a smaller, lighter product with a user-friendly graphic display screen.

The Total Army DAGR Fielding Program is being managed at the Fort Monmouth Field Office under the direction of Mr. Ed McAuley, (732) 532-6136 or DSN 992-6136.

FOOTNOTE: PM GPS requests every Army agency that obtained PLGR for test & integration work over the years to contact us immediately. Every available PLGR is needed right now for rework and issue to sustain our deployed forces! Contact Mr. Jim Buggy at (732) 532-4733, or via email at james.buggy@us.army.mil

(Submitted by Project Manager--Global Positioning System)

Emerging Technologies Form Futuristic Uniform

By Sgt. Lorie Jewell
Army News Service

Photo by Sgt. Lorie Jewell
Staff Sgt. Raul Lopez models a conceptual version of an Army Soldier's uniform in the year 2025.

ORLANDO, Fla.– Dressed in black from head to toe and wearing a helmet that allows barely a glimpse of his face, Staff Sgt. Raul Lopez looked like something out of a science fiction thriller.

Lopez, an infantry Soldier stationed at the Natick Soldier Center in Massachusetts, spent four days in what could be the Army uniform of the future at the 24th Army Science Conference, explaining the technology behind it.

The black fabric of the form-fitting suit would be made through the wonder of nanotechnology, which involves manipulating atoms and molecules to create things at the nanometer scale. That's about 50,000 times smaller than the diameter of a strand of hair. Soldiers wearing the suit would have the ability to blend into any environment, like a chameleon.

The helmet is the main hub of the uniform, where "all of the action happens," Lopez said. A tiny video camera in front provides 360-degree situational awareness. A series of sensors inside give the Soldier three-dimensional audiological hearing and the ability to amplify specific sounds, while lowering the volume of others.

Complete voice translation is also provided, for what the Soldier hears and what he or she says. Night vision sensors, minimized to the size of pencil erasers, are also in the helmet. Maps and other situational awareness information are projected on the inside of the visor, while everything the Soldier sees and hears is sent in real time up to higher headquarters.

"It's all voice activated," Lopez said. "I can tell it to show me where my buddies are, and it projects it on the visor."

Virtual reality technology would also play a part in helping the Soldier navigate an environment by projecting maps on the ground surrounding him or her.

Sensors detect threat, provide treatment

Thermal sensors weaved into the fabric of the uniform control its temperature, based on the Soldier's environment. An on-board respirator, tethered to the Soldier's back, provides a continuous supply of fresh air – eliminating the need for a protective mask. Should the Soldier have the visor up, or the helmet off, and breath in some kind of harmful agent, the uniform sensor will immediately detect it, release tiny embedded capsules to counter it and inject treatment into the Soldier's body.

From the waist down, a skeletal system allows the Soldier to carry two or three times his or her body weight, feeling only the weight of their own body through the technology of an XO muscle, which augments a Soldier's strength.

Wearing the futuristic suit doesn't make Lopez feel like a science fiction superhero, or invincible.

"It's just conceptual right now," he said, smiling.

Liquid armor protection

The uniform might be made out of fabric treated with another technology featured in the conference's exhibit hall, shear thickening fluid. Unofficially referred to by some as liquid body armor, STF is made of equal parts polyethylene glycol – an inert, non-toxic thickening agent used in a variety of common products, like some ice creams – and miniscule glass particles, said Eric Wetzel, who heads the STF project team in the Weapons and Materials Research Directorate of the U.S. Army Research Laboratory.

In a small glass vial, the light blue liquid is easily stirred with a small plastic stick – as long as the stick is moving in slow, easy motion. When sudden, rapid or forceful motion is applied, the liquid instantly hardens, preventing any movement.

"When the movement is slow, the glass particles can flow around each other," Wetzel explained. "But when the movement is fast, the particles bump into each other, preventing any flow of movement."

STF has been applied to regular Kevlar material, Wetzel said. The fabric's texture doesn't change; it looks and feels the same as if it hadn't been treated. Using a test swatch of four layers of untreated Kevlar – the normal thickness of body armor – Wetzel is able to stab an ice pick through the fabric. But when stabbing a treated section of fabric with all the force he can muster, the ice pick dents the fabric but can't penetrate through.

Research is being done into whether STF can be of use to the Army, Wetzel said. If it is, Soldiers may start getting gear treated with it in about two years, he added.

Photo by Sgt. Lorie Jewell
Flexible display screen technology is being developed at the U.S. Army Research Laboratory. It will allow Soldiers to project images, like maps, onto a portable, rugged screen that can be bent, rolled or folded, and take it with them wherever they go.

Paladin Full Load Cooling Test At TARDEC

By Steve Aamodt and Jerry Schuetz
U.S. Army Tank-Automotive Research, Development and Engineering Center


The M109A6 Paladin.

WARREN, Mich.--An M109A6 Paladin recently completed full-load-cooling tests here at TARDEC. The tests were conducted in cell nine of building 212. The vehicle's final drives were connected to dynamometers. With a modified engine capable of 14 percent more horsepower (500 HP as tested), and a transmission fitted with an M113 based torque converter, the vehicle met the specification requirement for tractive effort with an engine oil temperature only 9 degrees Fahrenheit over the limit.

The M109A6 is the latest configuration of the venerable 155mm self-propelled howitzer. It boasts a ballistic computer for quick and accurate firing. Many of the Army's 975 M109A6 howitzers are serving in Iraq. The M992A2 FAASV is a companion vehicle that carries ammunition for the Paladin and uses essentially the same power pack.

The purpose of the test was to evaluate the effect of modest improvements to the power pack. The standard 8V71T was modified by Detroit Diesel with new fuel injectors, more oil cooler tubes, and an intake air after-cooler.

The torque converter being evaluated was a model TC396, currently used in the M113 FOV and modified by Allison to fit the M109's XTG 411-4 transmission. The converter pump, turbine hub, and a backing plate were altered. The manufacturer, Allison Transmission, claimed the TC396 torque converter would allow the transmission to run cooler and would be a better match for the transmission. Adopting the M113 torque converter could reduce costs by leveraging volume production.


The M109A6 Paladin undergoes full-load-cooling test at TARDEC.

An up-powered power pack will be beneficial if the Army decides to improve other aspects of the howitzer that might make it heavier or decides to call for improved performance. The test was conducted in TARDEC's Test Cell 9 in building 212. Cell 9 is a large atmospheric test chamber capable of inducing a number of wind and temperature points. Cell temperatures can be controlled to range from ambient up to 160 degrees Fahrenheit. Wind speed of up to 20 mph can be achieved from any of eight different directions. The cell contains two absorption dynamometers capable of absorbing 88,000 ft-lbs of torque per vehicle side at speeds from 15 – 2500 rpm. The dynamometers can absorb 128,000 ft-lbs of torque at stall. For this test the vehicle power pack was instrumented with 198 sensors. Light banks were used to simulate solar radiation conditions under which the vehicle was designed to operate. Cell 9's primary technician, Pete Bonino, ran the test and did an excellent job. He has 20 years experience in Cell 9.

Three power pack configurations were evaluated: baseline, modified torque converter, and modified engine and torque converter. The first two configurations did not pass full load cooling per the spec requirement, but the third scenario was successful. At 115 degrees Fahrenheit, the vehicle achieved a .37 tractive effort to weight ratio. The coolant entering the radiator measured 226 degrees Fahrenheit at that point. The requirement is a minimum of .35 at 115 degrees Fahrenheit ambient temperature with 230 degrees maximum coolant temperature. Under this condition the engine oil ran hotter than required in the spec, however, with the

coolant at only 226 degrees Fahrenheit, a change to a slightly larger engine oil cooler may be all that is needed to bring the oil temp back down to the required temperature.

Conducting the full-load cooling test in Cell 9 is more cost effective and convenient than at APG or YPG. Engineers on the Paladin program are encouraged that the new engine and torque converter will provide greater tractive effort without overheating. Durability would still need to be evaluated before the improved power pack could be considered fully proven.

Mobile Unmanned Aerial Vehicle (UAV) Demonstrations

U.S. Army Aviation and Missile Research, Development, and Engineering Center

Unmanned Aerial Vehicles (UAVs) which were demonstrated at a Redstone Arsenal Test Range.

REDSTONE ARSENAL, Ala. – In October, the U.S. Army Aviation and Missile Research, Development and Engineering Center in conjunction with the Unmanned Aerial Vehicles (UAV) Systems Project Office conducted proof of principle UAV demonstrations.

These demonstrations were supported by the Unmanned Systems Initiative (USI) with involvement from the user community including Forts Benning, Rucker, Knox, and the Rapid Equipping Force. These demonstrations were the culmination of an effort that began in April with the Mobile UAV Request for Information (RFI), which was sent out to industry. A total of 35 responses were received, and 13 vendors were invited based on the information that was provided. Due to scheduling, legal considerations, or frequency allocation issues, 4 vendors participated.

The purpose of the RFI was to identify viable UAV systems capable of supporting operations with Army ground maneuver units. The RFI requirements included air vehicle weight up to 50 pounds, minimum endurance of at least 2-hours flight, tactical range of 10 to 15 km., and additional launch, recovery, and deployability constraints.

Other requirements were based on fuel, night operations, flight ceiling, Global Positioning System (GPS), and military communications. The Redstone Technical Test Center (RTTC) provided the facility, which demonstrated tactical ranges out to 10 km. While night operations were not conducted, all of the UAV systems had IR sensor capability. Interrogation of ground targets was performed.

The proof of principle UAV demonstrations showcased advanced R&D prototypes in various stages of maturity. The demonstrations included a vertical takeoff and land (VTOL) UAV capable of hovering in position and flying autonomously; hand launched electric propulsion UAV with modular payloads such as 4 cameras (electro-optical and infrared); a catapult launched UAV featuring on board storage of images and data and adaptive flight planning, and stabilized payload for staring at a point on the ground; a pneumatic launched UAV which utilizes real time kinematics (differential GPS) for recovery.

The information collected during the RFI and subsequent proof of principle demonstrations was part of a market survey of current UAV systems, with no associated procurement actions or contracts. The UAV vendors demonstrated their systems at their own expense. The close coordination between the Redstone Arsenal – based UAV Systems Project Office, the RTTC, the AMRDEC, and other members of the USI resulted in timely systems evaluations relevant to current and future needs of Army ground maneuver units.

(Submitted by U.S. Army Aviation and Missile Research, Development and Engineering Center Public Affairs Office)

ARL Responds To "Boots On The Ground" - Lab Designs and Fabricates Low-Cost, Easy to Install HMMWV Weapons Mount

By Michael Fluharty
U.S. Army Research Laboratory Public Affairs Office

John Bowersett aligns a HAWM for final milling. When attached to a HMMWV rooftop, the gun mount will enable a second weapon to be installed.

ADELPHI, Md.--The idea for an auxiliary weapons mount on the Army's humvee came from soldiers in the 173rd Airborne Brigade stationed in Italy while anxiously waiting their deployment into either Operation Iraqi Freedom or Operation Enduring Freedom.

Their needs were simple: give us a low-cost, reliable, easy-to-install roof-top mount for HMMWVs that will be a second location on which any one of several weapons can be quickly added or removed.

Their timeframe was not: yesterday.

This was the problem facing ARL's Andrew Ladas, a branch chief in the laboratory's Sensors and Electron Devices Directorate. Ladas' branch was tasked because of its expertise in design, engineering and fabrication, as well as their history in responding quickly to Soldiers' needs.

Working in-concert with the U.S. Army Materiel Command's FAST Activity, which helps to provide materials rapidly to field Soldiers, Ladas and his staff within six months had designed, redesigned, developed a prototype, gotten approval for and begun fabricating 40-pounds of cast steel into wedge-shaped platforms that move around the HMMWV roof turret ring and could be quickly bolted on by Soldiers in the field.

Their creation eventually came to be known as the HMMWV Auxiliary Weapons Mount – or HAWM, for short. Nearly 90 of the mounts have already been delivered and installed on units in Baghdad, including some from Maryland's National Guard.

Four different weapons can be secured to a HAWM: three increasingly more powerful machine guns and a grenade launcher.

For the Soldier in the field, the payoff was immediate. Not only did the HAWM now give Soldiers a range of vehicle-mounted weaponry for their protection, it also helps to distribute more evenly the weight from any other weapon already mounted on a HMMWV. More evenly distributed weight allows the gun turret to turn more easily.

"We've used the mount in combat and it's already saved lives," reports Soldiers in the 173rd.

For Ladas and others in his branch who worked on the HAWM, that acknowledgement is all the reward they need.

Comparing TARDEC's Motion Base Technologies

By Brian Brumm
U.S. Tank-Automotive Research, Development and Engineering Center

Volunteer on the mini-motion base in the CAVE with the IVB turned on.

WARREN, Mich.--The Advanced Collaborative Environments Team and Real-time Technologies Inc. (RTI) performed an experiment to satisfy the requirements in RTI's Phase II SBIR.

Experiments were performed to study driver performance differences between using the Ride Motion Simulator (RMS) and the mini-motion base CAVE driving simulator in off-road driving environments.

The experiments also studied the effectiveness of two simulator sickness mitigation techniques. These techniques include the ReliefBand, which was tested on the RMS only and an Independent Visual Background (IVB), which was tested on the CAVE driving simulator only. The ReliefBand motion sickness relief product is a wristband that a person wears to provide acupressure sensation on nerves in the wrist to help reduce nausea and vomiting due to motion sickness. ReliefBand is a FDA approved over the counter motion sickness relief product and is a Class II electronic medical device (http://www.reliefband.com). The IVB consists of the addition of vertical and horizontal lines superimposed over the driving scene provided by the simulator. The lines help provide an earth stationary visual reference which is hypothesized to reduce simulator sickness symptoms.

Twenty-four volunteers drove the mini-motion base CAVE driving simulator from May 26--28. Another 24 volunteers drove the RMS from June 8--10. The two simulators being tested vary in configuration and offer different levels of fidelity for both motion and visual cueing. Both the RMS and minimotion base CAVE driving simulators are designed to dynamically replicate actual conditions experienced by a system in operation. The re-configurable nature of the equipment and repeatability of the tests offer the ability to investigate design options before the construction of system prototypes. This reduces the cost to evaluate and improve the design of devices or the crew-station configuration being considered for use in advanced vehicle systems.

With the help of the Motion Base Technologies Team, the RMS cab was configured with a HMMWV console mounted on the motion base with the appropriate vehicle controls. The volunteers rode the RMS and operated these various hardware components while undergoing simulated dynamic vehicle motions supplied by the motion base.

The mini-motion base was placed within the CAVE environment. The mini-motion base was developed for commercial entertainment applications and has been operating in location-based entertainment settings for several years. Therefore, no safety problems are anticipated for manned tests utilizing this commercial equipment. The motion base has a built-up cab (BUC) mounted on it. The BUC consists of an operator seat, instrument package, and vehicle controls. The vehicle controls include the steering wheel, throttle, brake, and gearshift. The volunteers drove the virtual HMMWV through the same designated off-road test course as the volunteers on the RMS.

The experiment included two drives of approximately seven minutes each. The volunteers were asked to performed standard driving tasks as quickly as possible while maintaining their own comfort level. On the RMS, volunteers wore the ReliefBand motion sickness mitigation product during their drives. Not all volunteers had the ReliefBand turned on so that we could measure the difference between a user with and without mitigation. On the mini-motion base, the IVB was turned on for one of their drives. For the other drive, they will drive with the standard driving simulator display without the IVB.

Volunteer on the RMS shown through the surveillance cameras.

Preliminary results show that the volunteers were able to accelerate and brake better on the RMS than on the mini-motion base. The RMS has more realistic gas and brake pedals than what's on the mini-motion base. Some volunteers felt claustrophobic on the RMS. The sickness mitigation techniques did not appear to work very well. The ReliefBand seemed to work a little better than the IVB but did not work well enough to eliminate all motion sickness. Without analyzing the data and besides the acceleration and braking, this specific experiment did not make too much of a difference when using the mini-motion base or the RMS. The RMS does have more capabilities than the mini-motion base but the mini-motion base does have some of the capabilities that the RMS has and could possible replace the RMS in certain situations.

These experiments performed will enhance military vehicle crew station development by defining the differences in the way drivers drive in various classes of driving simulators. The results of these tests will be applied to improving and evaluating the design of the driving simulators being used in this study.

ECBC Investigating Nanotechnology Applications

Edgewood Chemical Biological Center

ECBC scientists are currently working on several projects that relate to nanotechnology.

EDGEWOOD, Md.--Edgewood Chemical Biological Center (ECBC) is investigating two nanotechnology applications with particular promise in solving military technological challenges.

Nanoelectronic Chemical Sensors, part of a new class of incredibly compact sensors utilizing nano-sized gold particles, allows rapid detection of some of the world's most deadly chemical agents. These palm-sized sensors (or "chemiresistors") are comprised of nanometer-sized gold particles that are encapsulated by monomolecular layers of functionalized alkanethiols, and are deposited as thin films on interdigitated microelectrodes. In addition, a simple three-volt battery (available at most retail outlets) can power the sensors, thus allowing them to operate continuously for up to 120 hours. When powered by a larger battery and utilizing low-duty cycle on-off times and optimized power conditioning, the sensors can provide a sensing capability for years.

In normal, uncontaminated air, the film has a certain level of electrical conductivity. However, when chemical (agent, explosive) vapors reversibly absorb into these thin films, a large modulation of the electrical conductivity of the film occurs. The measured current between gold clusters is extremely sensitive to very small amounts of monolayer swelling or dielectric alteration caused by the absorption of vapor molecules.

The second application, Nanoencapsulation, is a new method of encapsulating enzymes and other proteins in a way that maintains the bioactivity of the molecules, even at extreme temperatures and harsh pH levels. The invention of these polymer nanocapsules, to both protect and enhance the reactivity of such proteins, has a wide range of potential applications in biodefense, as well as medical applications, such as drug delivery.

This new method not only protects enzymes and proteins from inactivation under harsh conditions, but they can also be utilized as controlled-release agents or carriers for drug, protein and vaccine delivery. Protein/enzyme stabilization is critical to a variety of applications, including medical diagnostics, bioremediation, environmental cleanup, biocatalysis, and protein delivery.

(Submitted by Edgewood Chemical Biological Center Pubic Affairs Office)

Medical Sterilization Technology Showing Promise For Military

Edgewood Chemical Biological Center

These devices were used to detect any trace of chemical agent stimulant left after the mVHP test.

EDGEWOOD, Md.--A medical sterilization technology used in the private sector is showing promise as an effective decontaminant of sensitive military equipment, such as the interior of an aircraft. Until now, traditional military decontaminants have proven too caustic for use on electronics and computers.

Vaporous Hydrogen Peroxide, developed by STERIS Corporation and for years used in the medical community as a biological sterilant, was modified by Edgewood Chemical Biological Center (ECBC) scientists to decontaminate chemical agents as well. In November, ECBC scientists tested the Modified Vaporous Hydrogen Peroxide (mVHP) system on a C-141 aircraft. The system uses an extremely fine vapor of common hydrogen peroxide to eradicate chemical and biological agents, such as anthrax and botulinum.

This series of tests was conducted at Davis-Monthan Air Force Base in Tucson, Arizona, and were designed to evaluate the amount of time and vapor needed to thoroughly eradicate any chemical or biological agents. The data is currently being analyzed, but initial results from the testing show very promising results.

The VHP technology was used in 2001 to decontaminate several federal buildings after the 2001 anthrax attacks. In addition to being used on military planes, this technology could be transitioned to the commercial market to combat sick planes.

(Submitted by Edgewood Chemical Biological Center Public Affairs Office)

Photovoltaics Shine Into New Territory

U.S. Army Soldier Systems Center

NATICK, Mass. -- Sunlight is the bright filling station above that never asks for money or runs out of fuel for photovoltaic products, and some scientists believe that the sky is the limit for a new generation of photovoltaic technologies in development at the U.S. Army Soldier Systems Center here.

A promising technology that's existed for decades, photovoltaic (PV) solar cells convert light energy into electricity without noise, moving parts, fuel consumption or pollutant emissions. A breakthrough arrived in the past five years when PV technology transformed from the traditional large, heavy, rigid, reflective and expensive glass panels into lightweight, conformal and inexpensive devices that now can be directly integrated into textiles and warfighter systems, according to Lynne Samuelson, a research chemist in the Science and Technology Directorate.

"There's a lot of room to grow on how power is harvested according to the ambient light," Samuelson said. "Already it's at a usable level."

It's seen as boon to the military for a variety of reasons. Warfighters could cut their battery load weight in half when PV cells are used in combination with rechargeable batteries to power individual items such as night vision goggles, according to Steven Tucker, an electrical engineer in the Collective Protection Directorate.

"On 72-hour and longer missions, it makes a lot more sense to carry rechargeable batteries," Tucker said. "You get rid of that logistics tail by minimizing re-supply with disposable batteries. The benefit/weight payback for a photovoltaic charger and rechargeable battery combination is incredibly quick, and out past 72 hours it just keeps getting better."

Less weight means better mobility, and the ability to recharge batteries on-the-move can increase sustainability, extend mission times and distance from tactical operations centers, and reduce logistics support requirements.

Replacing or decreasing the number of liquid-fuel-powered generators further reduces logistics, and lowers the heat and sound signature in the field for improved stealth. It's also a potential lifesaver as an emergency back-up power in case generators fail, say, in a field hospital.

These benefits are possible because of new lightweight and flexible solar cells made with two complementary PV technologies, amorphous silicon and dye-sensitized nanocomposites.

Of the two, the mature amorphous silicon is the "workhorse" of photovoltaic technology, Samuelson said. "Basically, wherever there's a surface, you can lay it out and generate electricity. These things are so versatile, you can make them to do whatever you want." Iowa Thin Film Technologies in Ames, Iowa, advanced this technology through a quality award-winning Phase II Small Business Innovative Research (SBIR) effort by manufacturing a PV cell .005 inch thick, rollable to 3 inches diameter and less than 1.7 ounce per 250 mm by 300 mm frame.

Furthermore, the company developed a high-speed manufacturing process for the film and a unique process that allows finished PV product to be roll-laminated directly onto large swaths of shelter fabric.

"This gets away from the heavy glass of prior PV technologies," Tucker said. "PV made from amorphous silicon is mobile and deployable. It can take abuse. I've seen it cut and punctured and still be usable. What degrades over time is the protective covering, not really the PV cell itself."

Three prototype power-generating solar units were manufactured using the speedy process. A "Power Shade" that fits over two kinds of Army tents has PV material laminated into a mesh fabric that reduces solar load by 80-90 percent while generating up to one kilowatt of power for shelter electronics or battery recharging. The smaller TEMPER tent fly generates up to 750 watts, and at one-fourth the size of the fly, the "Quadrant" was designed to be placed wherever convenient and can be adjusted for better exposure to the sun. Its maximum power output is about 190 watts.

On a larger scale, PV cells on shelters for aircraft or field hospitals that cover thousands of square feet could generate 40-60 kilowatts of energy in peak sunlight. "These shelters are out there in the sun baking away, so why not try to take advantage of it?" Tucker said. "This is not just a one-pronged approach. We're approaching the issue of getting power to the warfighter from all sides."

A spin-off from the SBIR is a roll-up module that charges AA batteries. Tucker said the software algorithm that controls the charger was designed to deliver more current to the battery.

"This is a big one. There's nothing out there like this that we're aware of," said Samuelson. "This is the one (Special Operations Command) is excited about and is willing to try."

A colorful approach to PV technology is seen in dye-sensitized nanocomposites, which brings a new wave of possibilities without any sacrifice in power output to amorphous silicon.

Out of an Army Science and Technology Objective, Konarka Technologies in Lowell, Mass., formed to develop PV cells based on light-harvesting dyes that are adsorbed onto titanium dioxide nanoparticles.

Reliable, flexible power for warfighters can be manufactured from a PV layer less than .0005 inch thick that is manufactured onto plastic and into textiles, according to Samuelson. It's made possible because of lower manufacturing temperatures that will not melt the plastic. "The molecules give it color. We're looking at different color dyes and want to mimic the pattern used in the military," she said.

Demonstration of a photovoltaic fiber is a unique breakthrough for dye-sensitized nanocomposites, according to Samuelson, which could be woven into novel fabric-based PV devices that could be used where traditional PV devices were never thought possible, such as a detachable patch worn to prevent friendly fire or alert to chemical or biological agent contamination.

Konarka's reel-to-reel processing advantage is that it's inexpensive and widely available in foreign countries, and it may fulfill a dream of the late company founder as a way to produce inexpensive electricity in underdeveloped countries, said Samuelson.
"The applications will evolve with the technology," said Tucker. "It could be applied to toys so they don't need batteries or be a way to recharge cell phones or (personal digital assistants)."

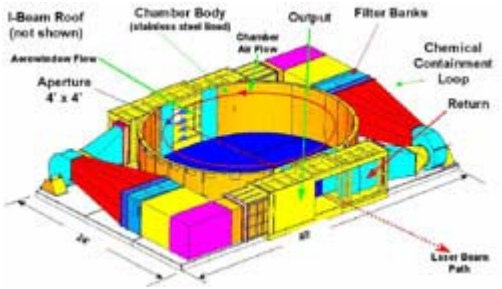
Eventually, direct integration into soldier-borne systems may create electronically-active textiles to minimize cables and connections, and provide a more streamlined and multi-functional warfighter system, according to Samuelson.

A new Science and Technology Objective, beginning this year and continuing through 2008, looks to branch out the self-powered electrotextiles theme to achieve PV power generation from virtually any surface.

(Submitted by U.S. Army Natick Soldier Center Public Affairs Office)

Standoff Detection Evaluation Technology

Edgewood Chemical Biological Center



The design of the new Vortex Chamber at ECBC.

EDGEWOOD, Md.--For the first time ever, precise performance measurements of standoff detection systems can be made in real-life conditions at Edgewood Chemical Biological Center's new standoff detection technology evaluation facility.

The only one of its kind in the country, the windowless Vortex Chamber utilizes curtains of air, produced by an interior vortex balanced by an exterior counter-flow of air, to contain a material cloud.

This allows researchers to release a known amount of material and maintain a calibrated material scatter, so that a standoff detector's ability to "see" can be accurately measured from up to several kilometers. This also prevents the backscatter off of conventional hard windows from corrupting the desired measurements on the cloud inside the chamber. This increased precision reduces uncertainty about the potential field performance of standoff detectors.

(Submitted by Edgewood Chemical Biological Center Public Affairs Office)

NAC's Soldier Mobility Program Reaches Out To Metroparks

By Steve Kolhoff
National Automotive Center


Don Youwchang, Congressman McCotter's office (R-MI 11), Dennis Wend, NAC, and Sgt. John Orskey, Kensington Metropark, with the chariot.

WARREN, Mich.--The U.S. Army Tank-Automotive Research, Development and Engineering Center's National Automotive Center (NAC) presented two American Chariot Personal Transport Vehicles (PTVs) to the Huron-Clinton Metroparks Authority at a ceremony held at the Kensington Metropark in Milford, Mich.

The PTV is a component of the NAC's Soldier Mobility Program, which tests vehicles in military and commercial scenarios before providing them to Soldiers in the field. Representatives from the office of Congressman Thaddeus McCotter (R-MI 11); Dennis J. Wend, executive director of the NAC, Sergeant John Orskey from the Kensington Metropark Rangers, and Steve Kolhoff from the NAC were on hand for the ceremony at the Kensington Metropark Golf Course.

"The National Automotive Center's Soldier Mobility Program allows the Army to get mission-critical vehicles in the hands of users," said Wend. "The feedback we receive from the Metropark Rangers will be vital in driving the requirements for the Next-Generation Hybrid-Electric Chariot."

The Chariot provides an innovative transportation solution for military law enforcement and industrial applications as well as for moving military leaders, messengers, supply personnel, or any other mobile soldiers quickly and efficiently.

The American Chariot is a three-wheeled, electric PTV that can reach speeds up to 20 mph and has a range of 15 miles. The PTVs' payload capacity (up to 350 lbs.), minimum footprint and zero emission electric motors make it ideal for transporting personnel at military bases, industrial complexes and even on ships and other non-traditional, heavy duty applications. The American Chariot PTV also gives emergency response teams the ability to move staff and necessary equipment through crowds with greater ease, offering greater access and response time to the scene of the emergency. The vehicle is also ideal for patrolling events, large crowd gatherings, shipping and staging areas and much more.

The Kensington Metropark Rangers plan to use the PTV for patrolling the bicycle paths, parking lots and picnic areas to increase security at the Metropark. "We're proud to work with the National Automotive Center to help test the suitability of the PTV for Soldier applications," said Sergeant Orskey. "Kensington Metropark spans 4,357 acres of wooded, hilly terrain. The PTV will help make the Metropark Rangers more efficient, visible and accessible."

The feedback provided by the Rangers will facilitate the development of the American Chariot's Military Special Hybrid Fuel PTV. This Next-Generation vehicle will offer the speed, endurance, maneuverability and visibility suited to meet the demands of Army transformation initiatives and today's highly mobile military environments.

The NAC is the Army's official link to working with commercial and academic partners to generate vehicles that will provide the Army with the mobility, survivability and agility it needs to operate efficiently and effectively in today's new threat environment. Headquartered in Warren, Mich., the NAC is TARDEC's technology transfer arm.

CERDEC Promotes Science to Middle School Students

By Daphne Hart
U.S. Army Communications-Electronics Research, Development and Engineering Center

FREEHOLD, N.J. --Representatives from the CERDEC participated in an awards ceremony at the Freehold Intermediate School on Nov. 16 to honor three regional winners of a national educational competition sponsored by the U.S. Army.

CERDEC Acting Associate Technical Director Henry Muller and Integrated Community Outreach Network (ICON) Managing Director Dr. Connie Zimmerman spoke to the students and offered their congratulations to the winning team, known as “The Monkeys.”

The students, Frank Bohn, Mackenzie Roche and Elizabeth Sawicz, participated in the web-based eCYBERMISSION, which the Army created three years ago in hopes of promoting math, science and technology among the nation’s young people.

“I am proud to be a part of this program,” Muller told the students on behalf of CERDEC Acting Director Gary Martin. “The Monkeys, along with other teams here at Freehold Intermediate School, raised important issues that affect our society.”

Representatives from the CERDEC, eCYBERMISSION and the Freehold Intermediate School pose with "The Monkeys," also known as Frank Bohn, Mackenzie Roche and Elizabeth Sawicz.

The Monkeys’ award-winning project involved increasing awareness of animal abuse amongst fourth grade students at their school.

CERDEC Operations Support Office Chief Suzanne Kelsey, retired ICON specialist Deborah Hoffman, eCYBERMISSION Program Manager Kelly Stratchko and Sgt. Maj. Enoch Godbolt also attended and presented each of the three sixth-graders with a savings bond for $3,500.

In his closing remarks, Muller invited other students to join the competition next year.

“We challenge the students who have not yet become a part of eCYBERMISSION team to make the decision today to accept the challenge and become one of those who help shape tomorrow’s nation.”

Zimmerman echoed that statement.

“We are extremely proud of our students as we know they worked long hours to complete their mission folders,” Zimmerman said. “We want them to continue their efforts and hope that they will accept the eCYBERMISSION challenge again this year.”

Oak Ridge National Laboratory's Conference on Detector/Sensor Research and Technology for Homeland and National Security

Oak Ridge National Laboratory

GATLINBURG, Tenn.--In the desperate days when the outcome of World War II was uncertain, the United States turned to its scientists for new weapons to defeat a resolute enemy. Now in the campaign against global terrorism, the expertise and creativity of the research community are again indispensable in equipping the country to thwart the intentions of enemies bent on chaos and indiscriminate in their targets. Tapping that expertise was the purpose of a gathering of more than 200 scientists and decision makers at a workshop on detector and sensor technologies held Sept. 14–16 in Gatlinburg, Tenn.

The Workshop on Detector/Sensor Research and Technology for Homeland and National Security was sponsored by the Chemical Sciences Division and the National Security Directorate of Oak Ridge National Laboratory. Its purpose was to provide a forum for communication and collaboration among U.S. scientists engaged in sensor/detector R&D and policy makers leading the development of technologies for national and homeland security. Representatives of the nation's security agencies came to talk about what they need to defend against terrorist attacks, and researchers came to share information on the state of the technologies and their hopes for better instruments to come.

More than 200 participants representing 82 public and private organizations attended the workshop, which featured more than 90 technical presentations and exhibits. The three-day event was organized around seven technical sessions covering sampling, detectors and concentrators for biological agents, detecting radiological/nuclear materials, elemental and isotopic mass spectrometry, miniature and portable mass spectrometry, micro-electro-mechanical systems and microsensors, and general forensics. Several plenary lectures provided context and direction for the overall event and for each technical session.

Frank Akers, ORNL's associate laboratory director for national security, outlined ORNL's goals for the meeting: identify needs for detectors and sensors for national and homeland security, provide a picture of the present status and future potential of detection technologies, explore opportunities for collaboration, alert decision makers to promising applications worth funding, and work toward a guiding vision for the R&D effort, informed by the needs of the security agencies.

The Security Needs.

Plenary speakers provided overviews of the technology requirements for detection tools for national and homeland security. Phil Williams, an expert on international security, organized crime, and computer crime from the University of Pittsburgh; and Michael Carter, chief scientist for the Science and Technology Directorate of the U.S. Department of Homeland Security (DHS), laid out the broad scope of the terrorist enterprise in keynote presentations. Maj. Gen. Jerry Humble, director of the Tennessee Office of Homeland Security, discussed on-the-ground needs of state and local agencies.

The United States is not winning the fight against terrorism, Williams said, because it has not grasped how to neutralize the advantages of networks of mobile, adaptable, highly committed enemies who can use our infrastructure as weapons. It isn't necessary for terrorists to smuggle weapons of mass destruction into the country when airplanes, chemical plants, and 18-wheelers are ubiquitous and easily weaponized. A new culture of security in both private and public sectors is essential to protecting the homeland, he said.

Williams cited a long list of major U.S. vulnerabilities, including billons of tons of maritime cargo entering the country yearly; lack of tracking and oversight of ships; millions of vehicles, including large trucks, entering our borders daily; unchecked entry of illegal aliens; insecure super-hub financial networks and other cyber systems; lack of surveillance of chemical plants and tankers; and lack of monitoring of the food supply.

Closing our security gaps will require devoting significant funding and attention to container security, Williams said. He cited the U.S. Coast Guard's Container Security Initiative, which calls for using technology to pre-screen high-risk containers and to develop tamper-proof casks. The whole society, both public and private sectors, needs to develop security maturity—multi-layered systems for preventing attacks and mitigating the damage of attacks that occur. Governments need to provide regulations, minimum standards of preparedness, and incentives for private-sector security initiatives.

Contrary to popular perception, "the federal government doesn't own the problem" of fighting terrorism, Carter said, noting that 80 percent of the critical infrastructure in the United States is owned and controlled by private companies. Much of what needs to be protected or kept off-limits to terrorists is under little or no government oversight. "We need a federal, state, local, and private approach," he said.

The burden of preventing and responding to terrorist activity falls on local, conventional law enforcement and first responders, not on counter-terrorism specialists, Carter pointed out. Thus the final step in the R&D process, transitioning sensing/detection technologies to end users, is critical. To be useful on the real battleground, detection tools must be easy for users to deploy with minimal training. User interfaces, for example, must be such that local law enforcement officers can manipulate them quickly and easily.

Another key real-world issue is the capability of instruments to detect chemical, biological, radiological and explosive materials quickly without an unacceptable proportion of false or nuisance alarms, Carter said. The sensitivity of sensing technologies is well established; making instruments that identify real hazards while screening out routine, licit materials remains a challenge. Yet another issue for the research community is the need to develop and implement sound standards for sensors and detectors. Carter asks, "We're asking state and local governments and the private sector to adopt these technologies, but how do they know what to buy?" To equip themselves appropriately, security forces must know whether an instrument works, whether it solves the right problem, how it can be tested, how it is used, whether it will work properly with their other equipment, and how to comparison shop.

Among DHS's top R&D priorities are several that touch directly upon detection technologies:

- Rapidly detecting releases of chemical/biological agents and mitigating their consequences to the population.
- Detecting illicit explosives.
- Preventing illicit traffic in radiological/nuclear materials.

DHS's program goals for biosurveillance include continuous environmental monitoring capability for metropolitan areas in the United States. Goals for chemical countermeasures include technologies that provide rapid response, low false-alarm rates, and detection of wide-area releases. For explosives, next-generation detectors are needed that combine trace and bulk capabilities, use commercial off-the-shelf components, combine different suites of capabilities for different applications, and allow long-range detection. Protection against nuclear/radiological attack demands a layered defense including monitoring of border crossings, seaports, inter-modal transportation, and air traffic; the involvement of state and local law enforcement; and perimeter protection for large population centers.

Maj. Gen. Humble of the Tennessee Office of Homeland Security cited a need for sensors for many types of users for many different purposes: hazard detection, medical response, public awareness, total situation awareness for officials, and analysis, modeling, and prediction. "We need technology for first responders, not big command centers," he said. To be widely used, instruments will have to be inexpensive because state and local agencies have limited budgets for equipment and training: "We need advanced technology, but we don't have much money for it," Humble said. First responders need tools with simple reporting methods—multiple monitors and complicated plume models are not useful. They need sensors appropriate to the nature of their locales, e.g., agricultural communities versus urban areas. And they need instruments that respond at appropriate levels of sensitivity.

For a state like Tennessee, threats to agriculture are a key issue, Humble said. He noted that plans for disseminating hoof-and-mouth disease (a highly contagious livestock disease) had been found in training camps in Afghanistan. If the disease were introduced in Tennessee, with present methods of detection, it could spread through much of the state's livestock population by the time it was diagnosed. Agricultural states need means of detecting and identifying such diseases before outbreaks can spread.

Tennessee is one of two states testing a system that unobtrusively monitors for radiological loads in trucks at large weigh stations and in boats at locks on inland waterways. Humble would like to have several other types of detectors at the disposal of his forces—sensors to sniff passing trucks on roadways, water-sampling sensors on buoys to detect toxins in bodies of water, and air-sampling sensors on police vehicles.

David Cullin, director of technology for the Joint Program Executive Office for Chem/Bio Defense, spoke to the technology requirements of the armed forces for sensing/detection technologies. (JPEO-CBD is responsible for chem/bio/rad/nuclear defense equipment, medical countermeasures, and installation and force protection for the U.S. military.) He listed key challenges for the Department of Defense: standoff (long-range) detection, chem/bio point detection (CPD and BPD), and diagnostic systems.

BPD instruments must provide rapid, automated detection, identification, and sample isolation of biological warfare agents. DOD needs instruments that do not rely on reagents, which are impractical to use in the field, and that can identify more than the 10 biological agents that currently available detectors identify. For CPD, rapid, hand-held, lightweight, inexpensive detectors are required. DOD's future CPD needs include tools using multiple technologies that can detect vapors, liquids, or solids at low levels. Detection of toxic industrial chemicals is becoming more important because of the increased emphasis on urban warfare.

Diagnostic systems must be able to rapidly pinpoint biological warfare agents to which forces have been exposed. Instruments must pass Food and Drug Administration clearance procedures, which are rigorous, Cullin noted.

Commanders need reliable standoff detection tools to give them early warning of releases, allowing them to take measures to prevent exposure of their forces. Standoff technology advances that DOE needs include on-the-move detection, hyper-spectral imaging sensors, network-centric detection, and active chemical detection. Size and weight are important because the detectors will be placed on unmanned aerial vehicles and on ground vehicles that already carry large loads. Therefore, it is important to develop instruments that integrate several capabilities in a single housing. Smaller, lighter, cheaper technologies will allow forces to disperse more detectors in the field, which will mean more information coming into the commanders.

Cullin echoed the call for instruments appropriate for non-expert users. "Sometimes these technologies are being used by 18-year-olds with two weeks of training," he noted. "You have to design them with the user in mind."

The Technologies.

Presentations at the workshop demonstrated the progress researchers are making toward developing precise, small, portable instruments for detecting biological and chemical agents, radiological and nuclear materials, and explosives. The applications for the technologies represented in the presentations and exhibits range from homeland protection to battlefield use; from detection of lethal materials before they can be exploited, to rapid detection of releases before they spread, to quick identification of released agents, to forensic analysis of the source and provenance of materials.

At a similar workshop a year ago, the emphasis was on mass spectrometry as a sensing technology. Although mass spec instruments also figured heavily in this year's event, the range of technologies was expanded to other detection methods, including DNA sampling for biological agents, microcantilevers, acoustic detection, luminescence, and algae fluorescence. A handful of presentations also addressed topics not strictly related to detection, such as inorganic membranes for filtering biological agents from water, and robust wireless communication for command centers.

Two technical sessions addressed sampling and sample processing and detectors and concentrators for detecting biological agents, technologies that have to do with improving the quality of the sample that is introduced to a detector for analysis. Sampling is critical because if the sample isn't good, the analysis developed from it cannot be accurate. Sample processing and concentration has been recognized as a weak link in sensor/detector development and therefore has become an area of emphasis in the research community.

A session on the detection of radiological/nuclear materials addresses a fear that looms large in the minds of officials and the public—terrorists armed with a nuclear device or with radioactive materials fabricated into a "dirty bomb" that could expose large numbers of people to contamination. Researchers summarized efforts to develop radiation detectors that are suitable for field work: small, portable, rugged, simple to use, and affordable. It also is important that detectors not generate significant amounts of

hazardous waste or emit radiation that could harm users. Detectors are being developed for a variety of uses, including field work, monitoring of drums and containers for radioactive materials, and in-use monitoring of vehicles and water-going vessels.

Micro-electro-mechanical sensors (MEMS) are a new class of sensing/detecting technologies that offer the potential for miniature, integrated, universal sensors capable of detecting chemical, biological, explosive, and radiological materials. MEMS have been developed that combine a large number of tiny sensors at the nano-scale, designed to detect different types of threats, in arrays on a unit not much larger in area than a postage stamp. MEMS are based on the principle that reactions on the surface of a microcantilever will cause a deflection that can be detected and analyzed to indicate the presence of a specific substance. MEMS are expected to be easy and inexpensive to produce, rugged, and highly precise.

Two technical sessions were devoted to different types of spectrometry—elemental and isotopic mass spectrometry and miniature and field-portable mass spectrometry: instrumentation and applications. Mass spectrometry is the gold standard of analytical methods to identify unknown substances. It can provide accurate analysis of the composition of compounds from very small samples or highly dilute concentrations. Spectrometers have historically been fairly sizable laboratory-based machines, and making them small and light enough for use outside laboratories remains the main challenge to more widespread use in terrorism-fighting applications. Presentations discussed several types of spectrometers that are field-portable, that is, they can be carried to a site and wheeled around. Small, hand-held spectrometers are not yet a reality. High-throughput, high-precision isotopic mass spectrometers are being developed that can analyze nuclear samples rapidly in batches. This will be useful in speeding the analysis of nuclear samples for non-proliferation efforts. Isotopic spectrometry also has potential for determining the sources of biological agents by analyzing the accumulation of metals in their spores.

Field-deployable mass spectrometers are being tested for use in screening airline passengers, boarding passes, or possessions for traces of explosives or drugs. Screening times have been reduced to a few seconds per item. A field-deployable mass spectrometer also has been tested successfully for use in analyzing the return air in buildings to identify various chemical compounds.

A session on general forensics presented several different types of forensic technologies. A technology has been developed for minimally destructive analysis of small samples, with no handling or sample preparation, by vaporizing a small area of the sample and analyzing the vapor by spectroscopy. A handheld acoustic inspection device conducts rapid, noninvasive examination of containers and identification of solids and fluids by pulsing an object with ultrasonic energy and analyzing the resulting echoes. It is useful for examining targets such as drums, tanker trucks, and seemingly solid ingots. An effort is under way to develop an “electronic nose” that can indicate contraband materials by detecting and identifying the chemical constituents of the odors they give off. Work is under way on other devices to detect and identify traces of explosives.

The Work to be Done.

Sensing and detection technologies are available that can readily detect and precisely analyze any substance of interest. The challenge in adapting these technologies to the needs of homeland and national security is to translate them into tools that are affordable, easily available, portable, robust, and user-friendly for first responders. Such tools must be sensitive enough to detect real threats virtually every time but selective enough to rarely give false alarms.

ORNL Director Jeff Wadsworth commented that in talking with police, firefighters, and other security personnel, he gets a different sense of what the issues are than might be apparent in a scientific workshop. Actually working with instruments on the front line is quite different from what it might seem in the laboratory. Shrinking that gap between laboratory and front line is an important front in homeland defense.

ORNL is already in the process of planning next year’s conference. We have tentatively selected mid-September 2005 (Sept. 18–21 for planning) as the timeframe. ORNL will select topic areas tightly focused on national and homeland security. The third annual workshop will feature a similar mix of plenary sessions outlining U.S. vulnerabilities and needs for sensors and detectors to protect the country, and technical sessions discussing how advances in science and technology can respond to those requirements. Plans are also to expand the exhibits and demonstrations of available instruments and involve more vendor participants.

(Submitted by Oak Ridge National Laboratory Communications and Community Outreach)

NASA Recognizes Contributions Of ARL Engineer

U.S. Army Research Laboratory

Dr. Edwin L. Fasanella

ADELPHI, Md.--Dr. Edwin L. Fasanella, an aerospace engineer for the Army Research Laboratory, has been recognized by NASA for significant contributions to the space program.

Fasanella led a NASA Langley team conducting studies of foam impact into the shuttle orbiter wing as part of NASA's Return to Flight Program. He was able to predict foam impact damage on various locations of the shuttle wing leading edge and validated the performance of an improved foam, which is a candidate for retrofitting on the orbiter external tank.

For his efforts, Fasanella was presented with a NASA Silver Snoopy award presented by Astronaut Robert Curbeam Jr., a veteran of two space shuttle flights. Silver Snoopys recognize outstanding performance that contributes to flight safety and mission success. Less than one percent of the space program workforce receives the award annually. Each awardee is presented a sterling silver Snoopy lapel pin that has flown on a space shuttle mission, plus a certificate of appreciation and commendation letter, both signed by the presenting astronaut. An astronaut always presents the Silver Snoopy because it is the astronauts' own award for outstanding performance, contributing to flight safety and mission success.

Fasanella received his doctorate in physics from Duke University in 1969 and began working in the field of impact dynamics and crashworthiness at NASA Langley in 1974. He has been assigned to the NASA Langley Structural Dynamics Branch as an Army Research Laboratory/Vehicle Technology Directorate employee since 1997. ARL is co-located with NASA Langley Research Center, Hampton, Va.

Fasanella was a key researcher in the NASA General Aviation Crashworthiness Program; the Controlled Impact Demonstration (CID), which was a remotely piloted crash test of a B720 transport aircraft conducted at NASA Dryden; the NASA Mars Sample Return Technology Development Program; and the NASA Aviation Safety Program.

Since February 2003, he has devoted his full effort to assisting in the Columbia space shuttle accident investigation and is currently leading the space shuttle impact test and analysis team at the Impact Dynamics Research Facility at NASA Langley. He is the author or co-author of more than 100 papers on impact testing, aircraft crashworthiness, and nonlinear dynamic modeling of impacts of aircraft and spacecraft.

(Submitted by U.S. Army Research Laboratory Public Affairs Office)

ARL Team Recognized For Improvements to Tank Gun Barrels

U.S. Army Research Laboratory

ADELPHI, Md.--A team from the Army Research Laboratory has been recognized by the Department of Defense's Office of Technology Transition for its work on improving the accuracy of tank gun barrels.

The Defense Manufacturing Technology Award is given annually to recognize individuals most responsible for technical accomplishments that help "realize a responsive world-class manufacturing capability to affordably meet the warfighters' needs throughout the defense system life cycle." Among the factors under consideration are rapid transition, affordability, technology cycle time, and best manufacturing practices.

According to ARL's nomination package, the goals of the Uniform Cannon Reshaping Team work were to produce both hardware and software for the production of tank gun barrels, as well as improving gun barrels in the field to enable significant improvement in the probability of accuracy on the first shot. Testing revealed an increase in probability of hits for six common types of rounds ranging from 21 percent to 54 percent. As the nomination indicated, "Test firings indicate barrel reshaping will provide accuracy improvements that are unequaled in the past twenty years." The technology will benefit gun barrels on all U.S. Army Abrams tanks.

In testimonials to the value of the project, two Army colonels separately referred to ARL's contribution to gun barrel accuracy as "a quantum leap forward" and as "the only real dramatic improvement in tank fleet accuracy since the introduction of the M1 Abrams full solution fire control system."

The ARL recipients of this award were Mark Bundy, David Webb, James Garner, Robert Kaste, Walter Roy, and Thomas Erline. All six recipients are part of ARL's Weapons and Materials Research Directorate, and were recently recognized with the 2004 Army Research and Development Achievement Award for the same project.

In addition to the contributions of these scientists, ARL also worked with the Army Aberdeen Test Center, Benet Laboratories in Watervliet, N.Y., and the Training, Doctrine, and Combat Development Directorate at Fort Knox, Ky. All three organizations were recognized as co-recipients for the award.

ARL employees had previously received the Defense Manufacturing Technology Award for their participation in projects in Advanced Optics Manufacturing in 2000, the Composites Affordability Initiative in 2002, and the Laser Shock Peening Initiative in 2003. This was the sixth year for the awards program. A separate award was given to a team composed primarily from the Air Force Research Laboratory for work in Lean Depot repair.

(Submitted by U.S. Army Research Laboratory Public Affairs Office)

CERDEC Engineer Wins AOC Research and Development Award

By Daphne Hart
U.S. Army Communications-Electronics Research, Development and Engineering Center

Austin "Pepper" Thomas, president of the Association of Old Crows (AOC), presents Dr. Wei Su of the CERDEC's Intelligence and Information Warfare Directorate with the AOC's 2004 Research and Development award.

Dr. Wei Su of the Communications – Electronics Research, Development and Engineering Center's Intelligence and Information Warfare Directorate (I2WD) has won the 2004 Association of the Old Crows' (AOC) Research and Development Award.

Su was presented with the award last month at the AOC's Annual International Symposium in San Diego for the work he has done throughout his entire career as an electronics engineer.

"This is a very challenging position. One needs to be a scientist as well as an artist," Su said of his tenure with the government.

Su's government career began at the U.S. Army Research Laboratory before joining the Communications – Electronics Research, Development and Engineering Command in 1997.

Some of the projects that Su has worked on during his career with the government include signal processing, modeling and simulation, design automation, and frequency control, which improve the performance of electronic warfare systems.

Currently, Su is working on automated signal classification that provides the ability to determine whether received signals belong to friendly or enemy forces.

But Su's career involves more than inventing cutting-edge systems and technologies, he also offers direct assistance to soldiers in the field as part of the Army Materiel Command's Field Assistance in Science and Technology Quick Reaction Coordinator.

"Warfighters in the field call or send us e-mails if they have a problem or a question about technical issues," Su said. "If I can't answer a question, I will help them to find an answer with right people."

Su said his positive work environment was instrumental to his success as an engineer. "I feel very happy and grateful to work at I2WD. Our upper managers and supervisor Isidore Venetos are very supportive of the research and development work that we do here," Su said.

Prior to the AOC award, Su had been honored by the Research and Development Council of New Jersey with their 2002 Thomas Alva Edison Patent Award for his invention that enhances the performance of electronic systems by eliminating vibration induced phase noise of crystal oscillators, which therefore allows systems to perform more accurately.

Su received both his Bachelor of Science in electrical engineering in 1983 and his Master of Science in systems engineering in 1987 from Jian Tong University of China.

After immigrating to the United States in 1987, Su earned his Master of Engineering in electrical engineering as well as his doctorate of philosophy in electrical engineering from The City University of New York in 1991 and 1992, respectively, before joining the U.S. Army Research Laboratory and U.S. Army Communications – Electronics Command as a research engineer.

In addition, Su is a senior member of the Institute of Electrical and Electronics Engineers, holds more than ten patents or pending patents and is the author of more than 90 technical publications.

ARL Researcher Receives Lifetime Achievement Award

By Tonya Johnson
U.S. Army Research Laboratory Public Affairs Office


Dr. Donald Eccleshall

ADELPHI, Md.--Dr. Donald Eccleshall credits his high school teacher, Mr. Singh, for pushing him towards a career in physics.

“He fired me up about physics,” said Eccleshall. “This was a time of a new era in physics during the end of the second World War. It was a time of change and progress in the field.”

Eccleshall is semi-retired and is currently working part-time for SRS Technologies in Bel Air, Md. He is also a guest researcher with the Weapons and Materials Research Directorate at the U. S. Army Research Laboratory in Aberdeen, Md. Eccleshall worked for the Army from 1968 until his retirement in 1997, and he received an ARL Award for Lifetime Achievement in November for his work in the technical community and Army applications.

“I’m honored to receive this award. I’ve been very lucky to have had some nice challenges,” said Eccleshall. “I’ve done some interesting research. Over the years I’ve noticed that the work we do has changed. We used to do more basic research. Now we’re much more focused on applications and producing technology quicker for soldiers in the field.”

Eccleshall is from Warrington, England, which is between Manchester and Liverpool. After a couple of years with the British Army, he graduated from the University of Liverpool in 1952 with a Bachelor of Science in physics and obtained a doctorate in physics in 1956. After receiving his doctorate, he worked for the Atomic Energy Authority for 10 years as a nuclear physicist in Aldermaston, England.

In 1966, he came to the U.S. on a sabbatical to the University of Pennsylvania. Two years later, he was offered a job in Edgewood, Md., to run an accelerator facility at the Ballistic Research Laboratory, which later became a part of ARL, and he has been there since. The facility was a large Tandem Van de Graaf accelerator. It accelerated charged nuclear projectiles, such as protons, that were used to obtain data on nuclear reactions of interest in the Army Nuclear Weapons Effects programs. Basic research was also conducted in conjunction with graduate students from universities within Maryland and across the country.

Some highlights of Eccleshall’s career include identifying applications and developing accelerator concepts for charged particle beam technology. DARPA and Sandia National Laboratories developed technology demonstrator accelerators based on his work. He also worked as part of a team with the South Korean Army before the 1988 Olympics that ran a program using electromagnetic, seismic and other techniques that were used to detect underground tunnels that could aid terrorists. His current research focuses on ways to make electromagnetic systems, such as electric guns, lighter and more efficient.

“Tangible technical and scientific results matter,” said Eccleshall. “You can develop a technique that can be fundamental to carry out a military operation. People doing technological research can make important contributions to the military.”

Eccleshall’s role models include physicists Albert Einstein and John Bardeen.

“Einstein revolutionized our concepts of time and space,” said Eccleshall. “Bardeen won two Nobel Prizes.”

Eccleshall has received two Army Research and Development Awards and is a member of the American Physical Society. In his spare time, he likes playing golf.

Soldier Life No Walk In The Park

By Marna Palmer
Night Vision and Electronic Sensors Directorate

The interns cooled down after a road march in the hot afternoon sun. They took turns carrying a 70-pound infantryman's pack to get an idea of what Soldiers endure.

FORT BELVOIR, Va.--When most newly hired interns come to the U.S. Army Communications-Electronics Research, Development and Engineering Center's Night Vision and Electronic Sensors Directorate (CERDEC), they expect to spend their first few years learning the ins and outs of life at the laboratory, familiarizing themselves with the systems and technology, and trying to figure out how to avoid the traffic on Interstate 95. They don't expect to spend their days pitching tents, flying in Blackhawk helicopters, and navigating through thick woods using night vision goggles (NVGs). But for four days in early September, that's exactly what a group of twenty interns did.

This group was part of the inaugural Greening course put on by NVESD. A civilian is "greened" when he experiences firsthand the military lifestyle. This course was designed to do just that for the technical interns of NVESD. The course is a requirement for all interns and one they once traveled to Fort Monmouth, N.J. to take.

Sending the interns to CERDEC headquarters was becoming a costly venture and talk of removing the course as a requirement surfaced. But Military Deputy, Col. Jim Wargo and R&D Coordinator, Maj. Benny Shepard had another idea. "We thought, we have the assets, the capability, why don't we set up our own course?" said Shepard. This would result in both money and time saved, plus, the interns would get to learn from the military that they would be working with in the future. However, as Shepard points out, "It's one thing to say, 'let's do it ourselves', but it's a completely different thing to actually do it."

Shepard approached the director of NVESD with his idea and soon had the support of the front office. Once they had this support, they set the dates and picked the interns who would be attending. The group of 20 was made up of some interns who had just signed on with NVESD, and others approaching the end of their internship. The interns came from all the divisions within NVESD, which afforded them the opportunity not only to meet the military, but also some of their peers that they will likely cross paths with in the future.

All of the interns were looking forward to the course, though with varying degrees of excitement. Matt Fetzer, an intern, said, "I cannot wait to go. I am excited to fly in a helicopter for the first time and I can't wait to shoot the guns."

When asked if he was looking forward to the course, intern Blaine Froeschl casually commented, "Sure. I enjoy outdoor activities, what's not to like?" Little did Froeschl know what he was about to embark upon. This course was no simple walk in the woods.

The first day of the course was conducted on site, at the NVESD compound, in a classroom like setting. Here, they learned about the force structure and ranks, chain of command, and the transformation the military has undergone in recent years. The day continued with demos of equipment Soldiers use regularly; the interns fired weapons, rode in Humvees, and used night vision goggles. Their first day concluded with a military formation, an exercise that was both confusing and amusing.

The short time spent in the classroom was one of the objectives Maj. Shepard set for the NVESD Greening course. Lynn Showers, NVESD training coordinator, explains, "Major Shepard shadowed the CERDEC course and then we started building ours. We took the basic ideas and lessons from the CERDEC course, and then made it more night vision focused. We wanted to stress knowing and understanding what the soldier goes through in the field when using the night vision technologies."

The interns reported for formation the next morning at 7a.m., and all laughter was put aside as they prepared for their first day in the field. The first stop on their journey was Quantico, Va. Here, they experienced NVGs for the first time outside a laboratory setting.

They were to complete a course with all kinds of obstacles, from scaling a seven-foot wall, to navigating through a mock minefield, in total darkness, while wearing the goggles. Another key emphasis of the exercise was to show the role of teamwork in a Soldier's life. Prior to beginning the greening course, the group had been divided into three squads that they would participate with in all activities. They were to start and finish each exercise as a group, leaving no one behind, just like Soldiers. The squads emerged from the course together, sweaty and red-faced, and with a new understanding of the necessities and limitations of the technologies they develop.

Following the visit to Quantico came what, to many interns, was the most exciting part of the four day foray into a Soldier's life. They boarded Blackhawk helicopters and flew, doors open at 2,000 feet, down to a U.S. government test site in Va. This was no simple scenic tour. The pilots performed maneuvers of all kinds, changing elevation quickly and frequently, and flying in all directions, even seeming to turn completely sideways at one point! The experience was one that the interns raved about for days following the completion of the course.

After arriving at the test site, the day continued with an introduction to land navigation. The interns figured out their own counting pace, and quickly and successfully found the three points that had been previously set up by the Soldiers. Drenched in sweat they made their way to the campsite where they put up two large tents and their cots for the evening. That night, they continued the land navigation exercise once again using the NVGs. This experience really gave the interns a whole different outlook at the effectiveness of the systems used in a real-world setting. Intern Jami Horne said, "The most important thing I took from the greening course is how essential it is for us to focus on the Soldier as we develop our sensor systems. Our equipment may work great in the lab, but if a soldier can't operate it reliably in the field, it is not a satisfactory design."

Aaron Elliot agreed and was surprised at the performance of the NVG's, "The biggest lesson that I took home was that things that work in the lab are not always stunning successes in the field. It's a fairly obvious lesson, but when you actually have to deal with it, it takes on an even deeper meaning. In lab, it's easy to fiddle with [the] NVGs, but in the field, when there's a legitimate enemy threat, even minor tinkering is too much."

These realizations embodied the main objective of the course: to give the engineers a taste of the Soldier experience to be kept in mind while developing new systems and technologies.

Day three began at dawn as the interns gathered their belongings and started a day of demonstrations. They were briefed on some of the larger military vehicles and tanks, and attended a demonstration on mines and countermine technology. "As an engineer within Countermine, these demos…motivate me to work towards….technologies which will better equip our soldiers," intern Brian Barlow said.

The interns also had their first taste of military cuisine, eating Meals Ready to Eat for lunch. After they were properly fueled up, they began a two-mile road march, each taking a turn carrying an Infantryman's pack. The pack weighed about 70 pounds and further reinforced the importance of size and weight considerations in the designing of night vision equipment. The march ended at the lodge, where they finally were able to take their first shower and enjoy a night of relaxing and team building with their fellow interns.

Thursday was the fourth and final day of the course. The interns were once again up early, this time for some physical training. After some stretches and resistance exercises, the group took off for a brisk morning jog. Once again the pack stuck together, slowing down as needed, and finishing strong. At the range, each of the interns fired a M240, M249, and .50-caliber weapon. This demonstration ended their military life with a bang.

The course was undoubtedly a success. Maj. Shepard was thrilled to see his vision come to life and was both surprised and impressed by the interns' attitudes throughout the week. "For me, the best part of working with the interns was their desire to receive the training that was provided. They exceeded my expectations in many ways and I have learned that they are very tenacious and dependable," he said.

SFC Ricardo Rivera echoed these sentiments, "The best part of working with the interns was their attitude towards the training and the way that they quickly adapted to the new circumstances."

The interns seemed equally impressed with the attitude of all the military involved with the course. “I really realized from talking to the military personnel that they enjoy what they do and each one of them feels very passionate about their work. Knowing that I am trying to provide support to someone who cares so much about what they do gives me a good feeling,” said Jason Bias. Barlow agreed with Bias, “There was a great balance in the relationships between the military and civilians and how we treated each other. Both groups had an appreciation for each other and what we were supposed to be getting out of the course.”

The interns also achieved a greater understanding and empathy for the Soldier, an experience that many felt will help shape their future work at NVESD. Jason Miller explained, “This course definitely gives you a better appreciation of what the soldier has to endure in the field. I now have a better feeling of what to take into account when considering the soldier using the equipment.”

Josh Moore shared Miller’s viewpoint, “This course has given me an experience that will help keep the Soldier at the forefront of my mind when considering the effects of size and weight.” This was MAJ Shepard, and the other military personnel’s, ultimate goal and they were happy to see it realized. Intern Mike Vitale summed up the course and its impact on his career here at NVESD the best, “You never know what it is really like until you walk a mile in their shoes. I have walked that mile.”

TARDEC Wins Four Research and Development Achievement Awards

U.S. Army Tank-Automotive Research, Development and Engineering Command

WARREN, Mich. - The U.S. Army's Tank-Automotive Research, Development and Engineering Center (TARDEC) announced that the Deputy Assistant Secretary of the Army for Research and Technology has recognized four TARDEC employees for the U.S. Army Materiel Command (AMC)'s 2004 Army Research and Development Achievement (RDA) Award. TARDEC's RDA Award recipients span three vital advanced military automotive technology developments supporting our Soldiers in Iraq, Afghanistan and the Global War on Terrorism.

This year's RDA Award winners were recognized at the 24th Army Science Conference in Orlando, Fla. TARDEC's RDA Award winners are:

- **CPT Greg Hetzel** and **Michael Manceor** – HMMWV Armor Survivability Kits (ASKs)
- **Michael John Clauson** - Vehicle Body Armor Support System (V-BASS)
- **Charles Acir** – Army Active Protection and Electronic Warfare Systems

"These scientists and engineers have distinguished themselves through their proven scientific and technical excellence," said Thomas H. Killion, deputy assistant secretary of the Army for research and technology, in a memo addressed to the Commanding General, U.S. Army Materiel Command. "Their individual contributions promise to improve the Army's capability, and to enhance our Transformation from the Current to the Future Force."

"Their hard work and dedication brings great credit to themselves, the U.S. Army Materiel Command and the U.S. Army," Killion added.

HMMWV Armor Survivability Kits (ASKs)

The add-on HMMWV ASK provides door, rocker panel and back plate armor protection and ballistic glass windows for all variants of the HMMWV. The kit was developed, manufactured and deployed in the matter of months after it became evident that the HMMWV was becoming vulnerable to small arms fire and Improvised Explosive Device (IED) attacks. These kits effectively stop those threats from penetrating the cabins of the Army's various HMMWV configurations. The Army is also working with the Marine Corps and Air Force to adapt these kits to the HMMWV armor requirements specific to those services. In support of Operation Iraqi Freedom, these kits have proven to be enormously successful in saving lives and limiting injury to HMMWV crews.

TARDEC was a 2004 recipient of the Research & Development Laboratory of the Year Award for its collaborative effort with the U.S. Army Research Laboratory (ARL) in developing the ASK. This award was presented by the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA ALT)/Army Laboratory Assessment Group (ALG).

Vehicle Body Army Support System (V-BASS)

The V-BASS is high performance body armor for truck drivers. Consisting of back, side and front plates, V-BASS straps into existing vehicle seats, providing logistics drivers increased protection from small arms fire and IED shrapnel. With over three times the protection level of standard body armor, more than 100 V-BASS systems have been deployed in support of Operation Iraqi Freedom.

Army Active Protection and Electronic Warfare System

The Army Active Protection and Electronic Warfare System integrates advanced survivability equipment and computer programs for hemispherical protection of ground combat vehicles. Detailed trade studies of all survivability technologies conducted under this program led to the Department of Army selecting and approving an optimal suite of survivability equipment for ground vehicle application.

“The hard work of these four individuals underscores TARDEC’s commitment to supporting the Warfighter,” said Dr. Richard McClelland, director of TARDEC. “Our dedicated associates take great pride in ensuring that the Army remains a relevant and ready force across the operational spectrum. Leading a number of Current and Future Force missions, TARDEC delivers superior technology for a superior Army.”

TARDEC, headquartered at the Detroit Arsenal, Warren, Mich., is responsible for developing and maintaining vehicles for all U.S. Armed Forces, many federal agencies and more than 60 foreign countries. TARDEC’s National Automotive Center is the Army’s official link to commercial industry, academia and government in developing new dual-use automotive technologies that meet the needs of both defense and commercial industries. Together, they lead the way in providing our Soldiers with vehicles and vehicle technologies that will increase survivability and ensure mobility on the battlefield while reducing design, manufacturing, operations and maintenance costs.

(Submitted by U.S. Army Tank-Automotive Research, Development and Engineering Command Public Affairs Office)

Natick Soldier Center Wins Lab of Year

U.S. Army Natick Soldier Center

NATICK, Mass. -- For the third time in the past four years, the Natick Soldier Center (NSC) at the U.S. Army Soldier Systems Center here, has won the Department of the Army Research and Development of the Year Award (Small Development Lab Category).

Claude M. Bolton Jr., assistant secretary of the Army for Acquisition, Logistics and Technology and Army acquisition executive, presented the 2004 award at the Army Acquisition Ball in Arlington, Va., Oct. 24.

A group of science and technology experts assembled by the Army judged the competition, ranking the results based on a written report and oral presentation delivered by Philip Brandler, NSC director.

"Being recognized as the Army Small Development Lab of the Year for the third time in four years is an outstanding accomplishment for the Natick Soldier Center that reflects upon the high quality of our work force, as well as the significant collaborative relationships we maintain with our corporate and academic partners, and the DoD partners collocated with us at the Soldier Systems Center," Brandler said.

Selection for the most prestigious award the Army bestows upon a research and development organization is based on extensive evaluation of the organization's vision, strategy and business plans; strategic management of human capital; competitive sourcing; improved financial performance; use of expanded electronic government; budget and performance integration; major management achievements; and major technical achievements.

This year, many of the criteria chosen for evaluation were directly linked to the president's management agenda. The NSC used its balanced scorecard strategic map to link resources, human capital, business practices and strategic initiatives to its core competencies of warrior-related technology generation, application and transition; warrior systems technology integration and transition; and solving warrior and warrior support-related field problems rapidly.

NSC's vision is to be the recognized center of choice for individual warrior-related technologies and warrior systems, and internationally known as a pre-eminent provider of Soldier-related research, development, engineering and integration services.

Identified as its most significant management accomplishment, partnering and leveraging helps the NSC to achieve its vision. NSC's nomination highlighted partnerships with Malden Mills for protective clothing, the Massachusetts Institute of Technology with their Institute for Soldier Nanotechnologies focused on creating new materials to dramatically improve the survival of Soldiers, the Institute for Collaborative Biotechnologies for biologically-derived or inspired materials for sensors, electronics and information processing, and the MIT Auto-ID Center, which is revolutionizing the supply management chain with radio frequency identification.

NSC chose its Joint Precision Airdrop System Advanced Concept Technology Demonstration program (JPADS ACTD) to highlight as a significant technical accomplishment. Ranked the No. 2 priority by Defense Department's Joint Requirements Oversight Council, JPADS enables warfighters to have equipment or supplies airdropped precisely where they want them to minimize ground troop detection, and dramatically reduce risk to the aircraft and aircrew from enemy fire.

Other advantages are smaller and more numerous drop zones, and multiple load delivery to multiple destinations from one release point. A technology segment from the ACTD transitioned through NSC's installation partner, Product Manager Force Sustainment Systems, for initial fielding in July in support of Operation Iraqi Freedom and Operation Enduring Freedom.

NSC's nomination also demonstrated the crucial role it plays in supporting the Global War on Terror and homeland security. Most significant was support to Special Operations Forces for individual and small unit equipment.

The Raven handheld Unmanned Aerial Vehicle, Protective Combat Uniform, and Low Visibility Body Armor Vest are a few examples of individual and small-unit items that were fielded in short notice to support ongoing operations in Southwest Asia.

"This award also underscores the significant impact that the Natick Soldier Center is having on the Global War on Terrorism, particularly as it relates to Soldier survivability, sustainment and quality of life in the field." Brandler said. "The Army and all of DoD enjoy the advantages we gain from the technology hub that surrounds us and our ability to access it for the benefit of the Soldier."

(Submitted by U.S. Army Natick Soldier Center Public Affairs Office)

Did You Know...

The Communications-Electronics Command Reset/Depot Level Repair Team at Camp Arifjan, Kuwait has recovered, captured and expedited shipment of $207 million dollars worth of CECOM equipment to several U.S. depot repair facilities. The team has also coordinated with repair facilities in theater allowing CECOM supply items, electronics, radios, and avionics to be repaired and re-issued for use in theater.

Just recently, the team recovered eight, brand new CYZ-10 COMSEC secure filling devices. The devices will go to a Marine unit and Army signal unit that are currently in theater.

(Submitted by Army Materiel Command, G5, Public Affairs Office)

Letterkenny Firefighter Honored For Heroism

A Letterkenny Army Depot Firefighter was recently honored by the Franklin County Board of Commissioners and the depot commander for his heroism in rescuing a man who was trapped in a house fully engulfed in flames.

Daniel Myers was recognized for his efforts by county officials Oct. 29 at the Franklin County Courthouse. He was later praised by Col. William Guinn, depot commander, during a private ceremony at the depot.

Myers received a commander's coin and a certificate of appreciation.

(Submitted by U.S. Army Materiel Command Public Affairs Office)

New Threat Emitter Overhaul Mission Nears Completion

TOBYHANNA ARMY DEPOT, Pa.--Technicians at Tobyhanna Army Depot have nearly completed a first-ever $1 million dollar overhaul of a threat emitter originally designed in the defunct Soviet Union.

The AN/MPST-1 Threat Emitter System was fielded by the Soviet Union in the 1960s to launch surface-to-air missiles. The United States obtained a system in the 1970s and used it to fabricate threat emitters to train pilots to avoid SAMs. Of the 14 remaining systems, most are used by the United States and some were sold in foreign military sales.

"This particular system was a foreign military sale to England, where it's used by the Royal Air Force," said Bill Rutkowski, range threat systems leader. The systems are composed of three antennas, or pedestals, and a control van. The antennas emit threats on different frequency bands, called the G-band, I-band and S-band. The depot is currently overhauling the G-band system, and the I-band system was completed in September 2003.

The effort has taken about two years due to the system's complexity, poor condition and the mission's newness. However, Rutkowski said the depot has been in contact with the RAF and noted that they have been understanding of what it takes to bring the system to like-new condition.

(Submitted by U.S. Army Materiel Command Public Affairs Office)

Former POW Visits AMC, Addresses Soldiers

FORT BELVOIR, Va.--Former Prisoner of War, Shoshana N. Johnson, recently visited the Army Materiel Command to discuss her experience in Iraq and her time in service. Johnson is identified by Army officials as the first female POW of Operation Iraqi Freedom and the first black female POW in U.S. war history.

Johnson credits NCOs for her development as a Soldier and admires their quick thinking and leadership skills.

"NCOs are trained to take care of Soldiers, and that's what they did," Johnson said in reference to her experience in Iraq. "I would not be here if it weren't for NCOs."

In addition, during Johnson's tour of the AMC Technology Gallery, she cited some advantages of the new Army Combat Uniform. Since the name and rank are attached to the uniform with Velcro strips, the tags can be easily removed prior to being captured by the enemy.

"This (uniform) would have helped me in my situation," Johnson said.

Johnson retired from the Army on a temporary disability honorable discharge. She currently travels across the country for public appearances and motivational speaking to people of all ages and diverse backgrounds.

(Submitted by U.S. Army Materiel Command Public Affairs Office)

Travel Tips For The Holiday Seasons

The holiday season is upon us once more. During this time period, more and more travelers will be flocking to the airports, train/bus stations and the roadways to travel all over the world visiting family and friends. What should we expect?

Heightened security measures at airports will make the process of arriving, checking in and boarding an airplane longer. Knowing what to expect and being prepared for emergencies can make your trip both safe and enjoyable. With that in mind, here are some tips on how to get to your destination, with as little inconvenience as possible. Remember security is everybody's business.

Do not pack or bring prohibited items to the airport. Sounds simple enough but you would be surprised to see the types of things our fellow passengers attempt to bring on board. Click on the following web sites to see a complete listing of prohibited items www.bwiairport.com or www.tsa.gov/public/interapp/editorial/editorial_1254.xml (click on customer assistance (Do's and Don'ts)).

Avoid wearing clothing, jewelry and accessories that contain metal. These items may set off the alarm on the metal detector.

Footwear is a concern and may require additional screening such as: boots, platform shoes, footwear with a thick sole or heel, and footwear that contain metal. In order to speed you through the screening process wear footwear that is easily removable.

If you wish to lock your baggage, use a TSA recognized lock. If you choose to lock your suitcase with another type of lock, don't be surprised if it is cut off when you pick it up at baggage claim. www.tsa.gov/public/interapp/editorial/editorial_1634.xml

Do not bring prohibited lighters and matches to the airport.
www.tsa.gov/public/interapp/editorial/editorial_multi_image_with_table_0099.xml

Do not wrap gifts or packages.

Vehicles are subject to search prior to parking. Reduce the numbers and types of packages and equipment in your vehicle to those necessary for travel or road safety measures.

The availability of curbside baggage check-in is severely restricted and subject to rapid change. Please check with your Airport to determine what procedures are in place and the estimated time you should allocate to participate in these procedures
A boarding pass and proper identification are now required to pass through the Security checkpoint. Tickets and ticket confirmations will no longer be accepted at these checkpoints. Only ticketed passengers are allowed beyond the screener checkpoints, except for those with specific medical or parental needs. If you refuse to be screened at any point during the screening process, the screener will deny you entry beyond the screening area. You will not be allowed to fly and could face criminal charges.

Each traveler is limited to one carry-on bag and one personal item (laptop computer, purse, small backpack, and briefcase). Stay especially alert and don't leave anything unattended as it could be subject to tampering and/or theft and never carry anything for another person, especially for someone you do not know. History has shown that criminals and terrorists use unwitting passengers to carry bombs or other dangerous items.

If you see an unattended package or bag in the terminal, report it to the airport security staff or other airport authorities. If you overhear someone bragging or talking about plans to harm citizens or cause damage to the airplane, report it to the airport security immediately. Take what you hear seriously and don't talk yourself out of reporting it.

Once on the airplane, listen carefully to the safety briefing and read the safety card. Visually locate the plane's emergency exits both in front and behind you. Count seat rows between you and at least two exits www.faa.gov/passengers/SafetyTips.cfm.

If sitting in the exit row be aware of your responsibilities. You must be physically capable and willing to perform emergency actions in the unlikely event of an emergency. If you are uncomfortable with doing this, please request another seat.

If you are planning to travel overseas for pleasure or business, monitor current events and review the latest information on any countries you plan to visits on the State Department's web site at www.state.gov. Familiarize yourself with local laws and customs of the countries to which you are traveling. Remember the U.S. Constitution is not applicable in other countries! While in a foreign country you are subject to its laws.

Register with the nearest U.S. embassy or consulate through the state department's travel registration website prior to your departure. Registration will make your presence and whereabouts known in case it is necessary to contact you in an emergency.
Have a valid passport and signed visas, if required. Fill in the emergency information page of your passport. Make two photocopies of your passport identification page, airline tickets, driver's license, and credit cards. Leave one copy at home and pack the other in a place separate from where you carry valuables.

Keep medicines in their original, labeled containers to avoid problems with customs. If you were glasses or contact lenses, pack an extra pair.

To avoid being a target or crime, try not to wear conspicuous clothing and expensive jewelry and do not carry excessive amounts of money or unnecessary credit cards. Apply the same common sense that you would at home. Be cautious in or avoid areas such as crowded subways, train stations, elevators, market places, and festivals where you are more likely to be victimized.

Important links:

Amtrak Train Stations - www.amtrak.com
Greyhound Buses - www.greyhound.com
Cruise Lines - www.lccl.org
US Customs - www.customs.ustreas.gov

Remember that all government personnel are required to receive an OCONUS briefing prior to departure. Contact your security office for more information.

(Compiled by the U.S. Army Research Development and Engineering Command Antiterrorism, Law Enforcement and Physical Security Team)